DOCKET NO.: HENK-0184/H50058   **PATENT**
Application No.: 10/808,992
Office Action Dated: May 21, 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Confirmation No.:** 7745
Schoenfeld

Application No.: 10/808,992   **Group Art Unit:** 1712

Filing Date: March 24, 2004   **Examiner:** Robert E. Sellers

  For: Polycarboxy-Functionalized Prepolymers

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

SUPPLEMENTAL DECLARATION OF
RAINER SCHOENFELD UNDER 37 C.F.R. § 1.132

I, Rainer Schoenfeld, hereby declare the following:

1. I am the inventor of the above-captioned patent application ("the present application"). I received my diploma thesis in Chemistry from the University of Duesseldorf and did postgraduate work on Molecularly Imprinted Polymers (MIPs) at the Polymer Institute of the University of Duesseldorf. I am presently the head of the polymer research department at Henkel KGaA, assignee of the subject matter of the present application, in Duesseldorf, Germany.

2. I am skilled in the art of organic synthesis. I am also skilled in the art of structural analysis, including the interpretation of ^{1}H and ^{13}C Nuclear Magnetic Resonance ("NMR") spectra, as they pertain to organic molecules.

3. It is my understanding that the claims of the present application are directed to curable compositions containing certain polycarboxy-functionalized prepolymers, in particular, a curable composition comprising at least one polycarboxy-functionalized prepolymer having the structure $R^1[-X-C(=O)-Cy CO_2H)_q]_n[-X-C=O)-R^3-CO_2H]_p[X-H]_{m-(n+p)}$, or at least one reaction product of said polycarboxy-functionalized prepolymer with at least one epoxy resin, or a mixture thereof, wherein R^1 is the m-valent radical of an elastomeric polymer, X is –S-

or NR_2-, Cy is an aromatic or aliphatic ring, R^2 is H or a C_1-C_6 alkyl group R^3 is a radical

containing at least one carbon-carbon double bond, m is an integer from 2 to 6, n is an integer

from 1 to 6, p is 0 or an integer from 1 to 5, m is greater than or equal to n+p, and q is an

integer of at least 2 and wherein said polycarboxy-functionalized prepolymer does not

contain imide groups.

4. I have reviewed the Office Action dated May 21, 2007. I understand that the

Examiner has maintained that there is no indication in U.S. Patent No. 5,093,382 that the

reaction of a polyoxyalkylene polyamine and a polycarboxylic acid anhydride, such as

trimellitic anhydride, forms imide groups.

5. I have reviewed the 382 patent. The only example of a reaction of a polyoxyalkylene

polyamine and a polycarboxylic acid anhydride is Product F in the 382 patent. Product F is

produced by the reaction of JEFFAMINE® D-2000 diamine and trimellitic anhydride (1/2

mole ratio). 382 patent at 15:43-33. The 382 patent states that Product F can be prepared "by

the procedure put forth in U.S. Pat. No. 4,239,635 or alternatively, without the use of solvent

at temperatures of about 210-235 °C." 382 patent at 15:25-29.

6. I reviewed the procedure set forth in U.S. Pat. No. 4,239,635, Example 1, and

synthesized Product F according to that procedure as follows: Trimellitic anhydride (38.4 g,

MW=192 g/mol, 0.2 moles) and Jeffamine D-2000 (206.2 g, MW=2062 g/mol, 0.1 moles)

were reacted together in 70 mL of toluene, under a nitrogen atmosphere, at 140 °C for 3

hours. The water generated during the reaction was continuously removed. After the 3

hours, the toluene was removed at 80 °C under reduced pressure (0.1 mbar). I will refer to

the product of this procedure as Product F-1.

7. I also prepared Product F according to the alternative procedure set forth in the 382

patent, i.e., "without the use of solvent at temperatures of about 210-235 °C," as follows:

Trimellitic anhydride (38.4 g, MW=192 g/mol, 0.2 moles) and Jeffamine D-2000 (206.2 g,

MW=2062 g/mol, 0.1 moles) were reacted together in the absence of solvent, at 210 °C, with

stirring, for 3 hours. I will refer to the product of this procedure as Product F-2.

8. ^{1}H and ^{13}C NMR analyses were performed on both Product F-1 and Product F-2.

These analyses were performed by Dr. Monika von Nussbaum and Barbara Hengesbach at

the Henkel Corporate Analytical Center in Dusseldorf, at my direction. Copies of these

spectra are attached as Exhibits A-D. Exhibit A is the ^{1}H NMR of Product F-1. Exhibit B is

the ^{13}C NMR of Product F-1. Exhibit C is the ^{1}H NMR of Product F-2. Exhibit D is the ^{13}C of Product F-2.

9. The ^{1}H and ^{13}C spectra for both Product F-1 and Product F-2 are identical.

10. It is known in the field that in a ^{1}H NMR spectra, an amide hydrogen should appear at about 9.0 ppm. Neither spectra has any peaks at or about 9.0 ppm. This is indicative that no amides are present.

11. It is known in the field that in a ^{13}C NMR spectra, an imide carbon should appear at about 168 ppm. Both spectra have peaks at 168 ppm. This is indicative of imides being present.

12. Based on the ^{1}H and ^{13}C NMR spectra of Product F-1 and Product F-2, both products contain imide groups.

13. The undersigned hereby declares that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 11 - 20 - 2007

Rainer Schoenfeld
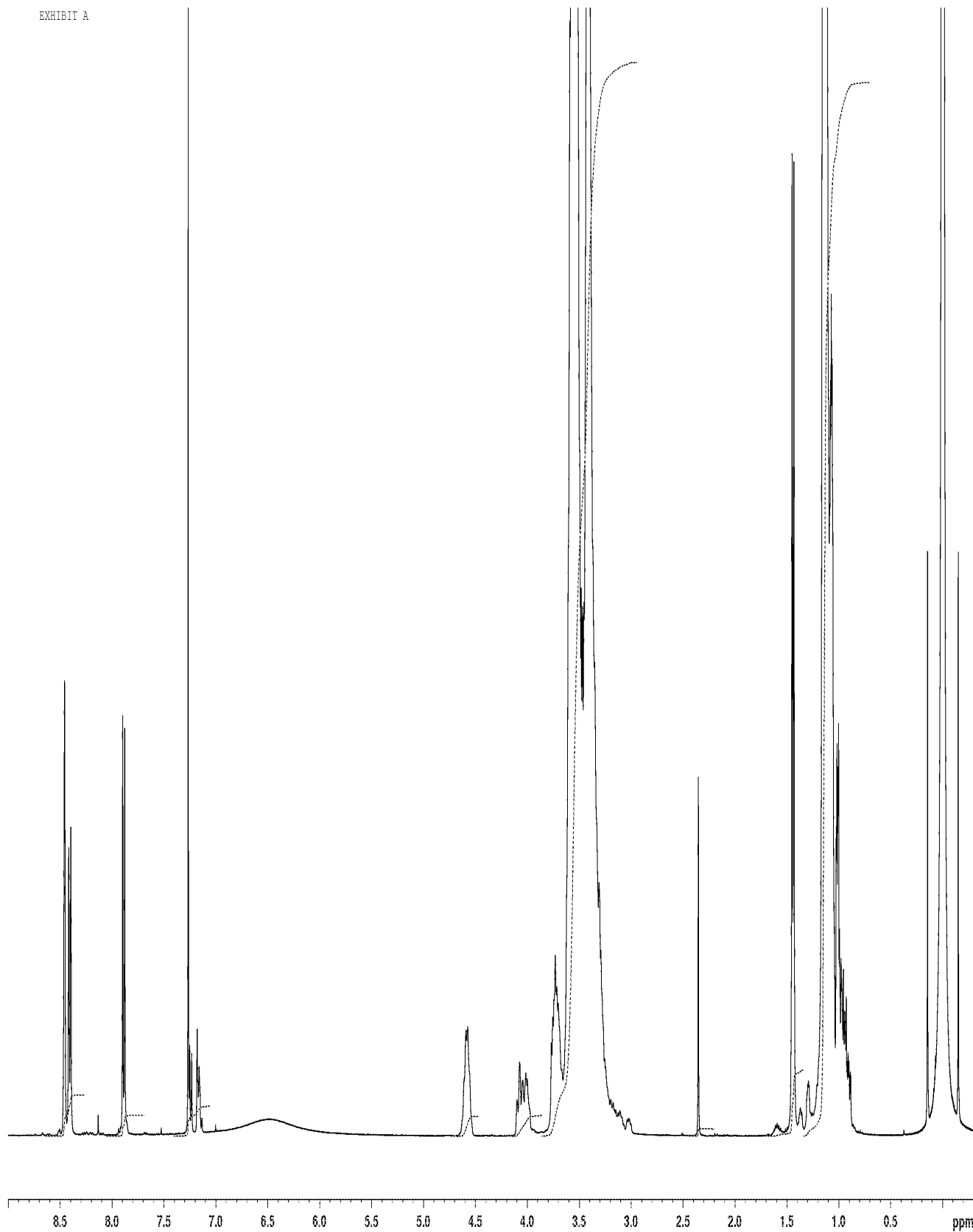
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PROCNO   1

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TD   32768
SOLVENT   CDCl3
NS   64
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SWH   8802.817 Hz
FIDRES   0.268641 Hz
AQ   1.8612725 sec
RG   32
DW   56.800 usec
DE   6.00 usec
TE   298.2 K
D1   10.00000000 sec
MCREST   0.00000000 sec
MCWRK   0.01500000 sec

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PL1   3.00 dB
SFO1   400.1234010 MHz

F2 - Processing parameters
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PC   1.00

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PROCNO   1

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DW   15.700 usec
DE   6.00 usec
TE   298.2 K
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MCWRK   0.01500000 sec

CHANNEL f1
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P1   25.50 usec
PL1   3.00 dB
SFO1   100.6229211 MHz

CHANNEL f2
CPDPRG2   waltz
NUC2   1H
PCPD2   100.00 usec
PL2   0.00 dB
PL12   23.74 dB
PL13   28.00 dB
SFO2   400.1316005 MHz

F2 - Processing parameters
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WDW   EM
SSB   0
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GB   0
PC   1.00

EXHIBIT C

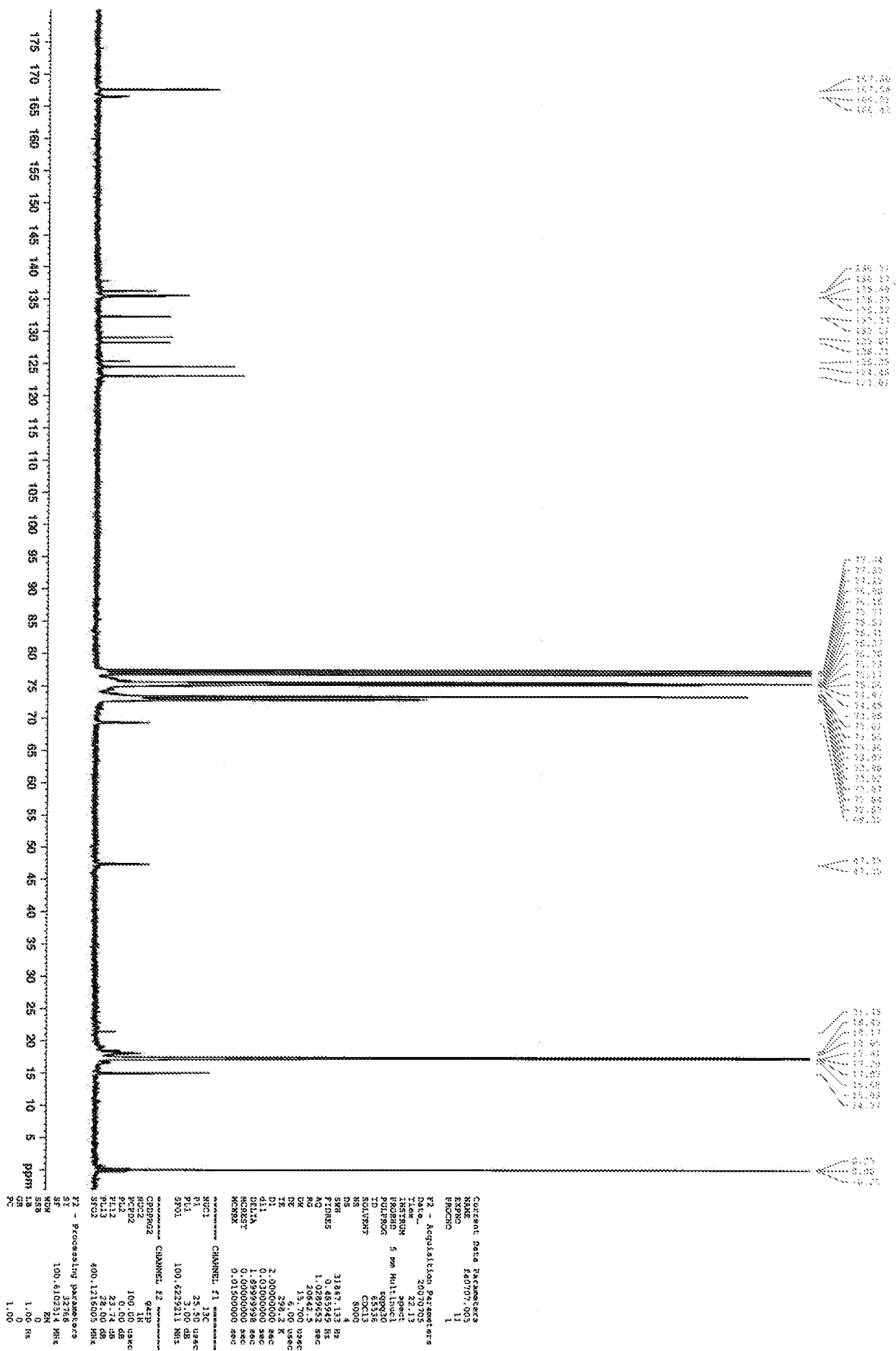Current Data Parameters
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PROCNO   1
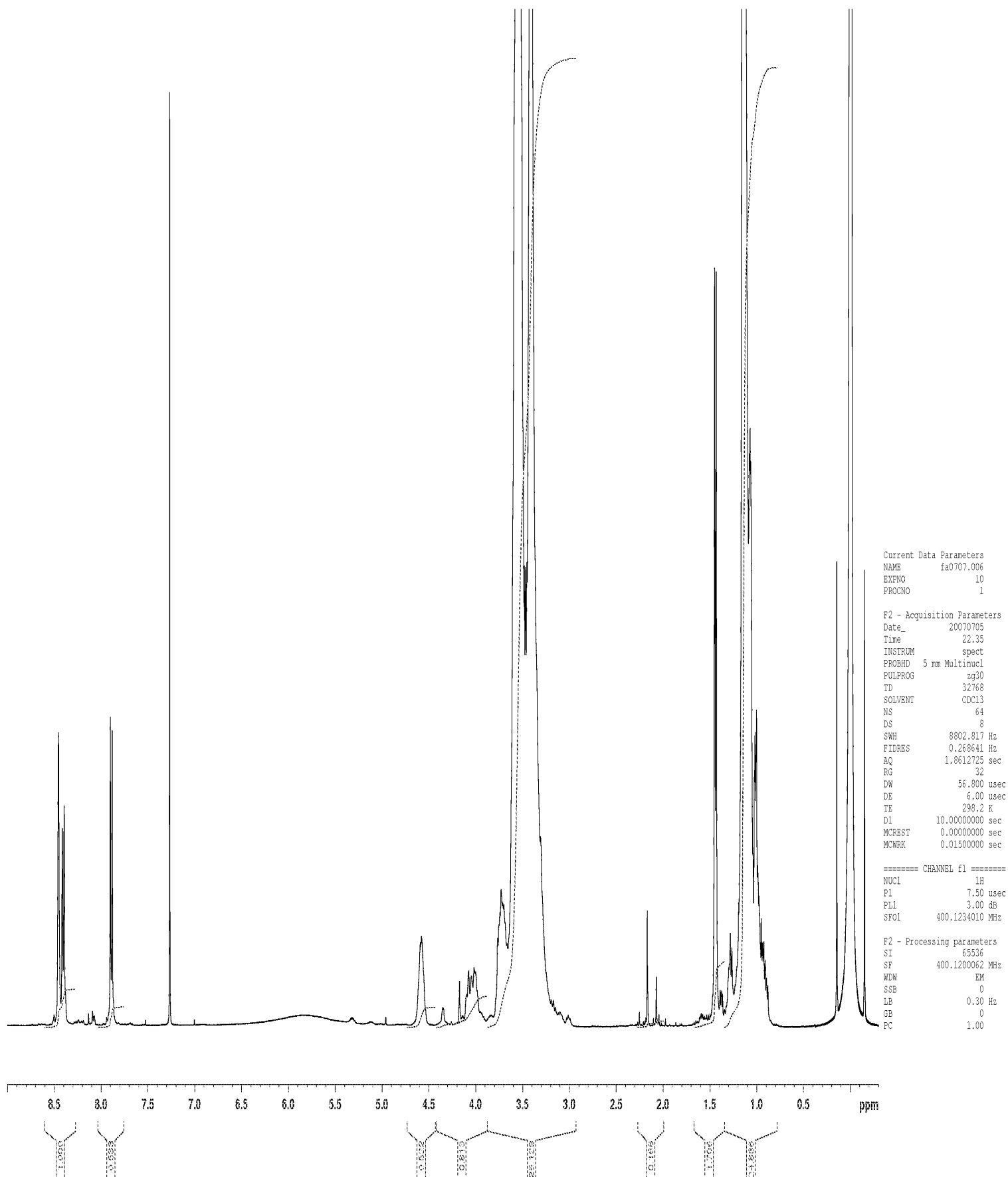
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TD   32768
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NS   64
DS   8
SWH   8802.817 Hz
FIDRES   0.268641 Hz
AQ   1.8612725 sec
RG   32
DW   56.800 usec
DE   6.00 usec
TE   298.2 K
D1   10.00000000 sec
MCREST   0.00000000 sec
MCWRK   0.01500000 sec

======== CHANNEL f1 ========
NUC1   1H
P1   7.50 usec
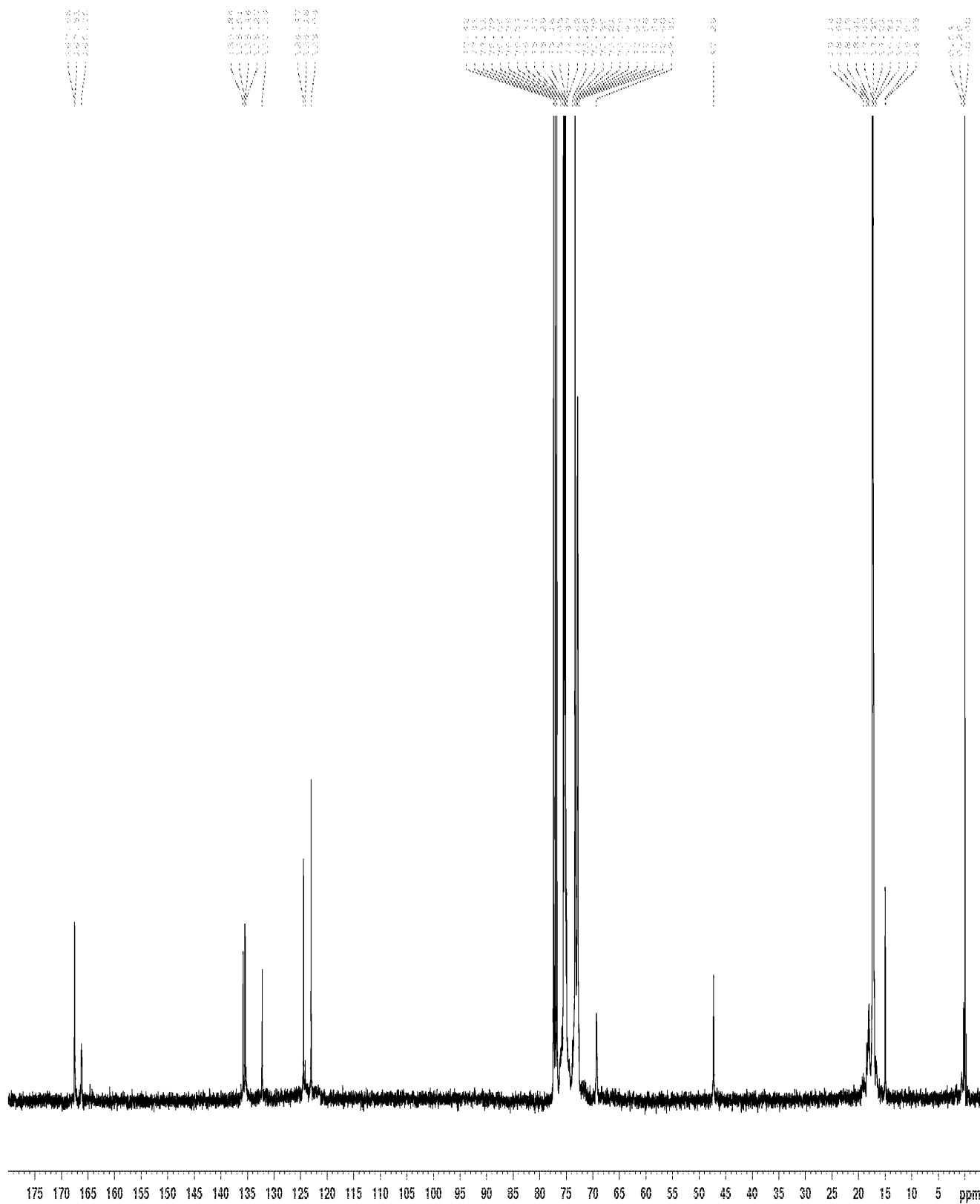PL1   3.00 dB
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F2 - Processing parameters
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Exhibit D

Current Data Parameters
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EXPNO   11
PROCNO   1

F2 - Acquisition Parameters
Date_   20070706
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TD   65536
SOLVENT   CDCl3
NS   8000
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FIDRES   0.485949 Hz
AQ   1.0289652 sec
RG   16384
DW   15.700 usec
DE   6.00 usec
TE   298.2 K
D1   2.00000000 sec
d11   0.03000000 sec
DELTA   1.89999998 sec
MCREST   0.00000000 sec
MCWRK   0.01500000 sec

======== CHANNEL f1 ========
NUC1   13C
P1   25.50 usec
PL1   3.00 dB
SFO1   100.6229211 MHz

======== CHANNEL f2 ========
CPDPRG2   garp
NUC2   1H
PCPD2   100.00 usec
PL2   0.00 dB
PL12   23.74 dB
PL13   28.00 dB
SFO2   400.1216005 MHz

F2 - Processing parameters
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SF   100.6102514 MHz
WDW   EM
SSB   0
LB   1.00 Hz
GB   0
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